

Europe, we meet with the difficulty that little is known of the plants of the Lower and Middle Devonian in Europe. There are, however, specimens in the Museum of the Geological Survey which show, in connexion with facts which can be gleaned from the works of continental writers, that *Psilophyton* occupied the same important place in Europe which it did in America; and in the Upper Devonian the generic forms are very similar, though the species are, for the most part, different.

In Eastern America no land flora is known below the Upper Silurian; and even in that series the plants found are confined to the genus *Psilophyton*. Independently, however, of the somewhat doubtful Lower-Silurian plants stated to have been found in Europe, there are indications, in the Lower-Erian flora, that it must have been the successor of a Silurian flora as yet almost unknown to us; and the line of separation between this old flora and that of the Devonian proper seems to be at the base of the Middle Devonian.

In applying these facts and considerations to the questions relating to the introduction and extinction of species, and the actual relations of successive floras, it was proposed to compare what might be called specific types,—that is, forms which in any given period could not be rationally supposed to be genetically related. Of such specific types, at least fifty may be reckoned in the Erian flora; of these, only three or four are represented in the Carboniferous by identical species, while about one half are represented by allied species. The remainder have no representatives.

A Table of specific types of the Erian was given, and its bearing shown on the questions above referred to; and the hope was expressed that by separating such types from doubtful species and varietal forms, some progress might be made towards understanding, at least, the times and conditions in which specific types were introduced and perished, and the range of varietal forms through which they passed.

MISCELLANEOUS.

Observations on some Indian and Malayan Amphibia and Reptilia.

By Dr. F. STOLICZKA. (Abstract.)

THE species described in this paper have been partially collected by the author along the Burmese and Malayan coast, in Penang, and Singapore, partially at the Nicobar and Andaman islands; only a few species are noticed from Java, and a few also from the N.W. Himalayas. Short notes on the geographical distribution, and on the general character of the amphibian and reptilian fauna of the Andamans and Nicobars, form a brief preface to the detailed descriptions. Complete lists of all the known species occurring on the two last-named groups of islands are appended.

The following is a list of the species noticed, with the localities wherefrom specimens have been obtained, and brief characteristics of the new species.

AMPHIBIA.

BATRACHIA.

1. *Rana gracilis*, Wieg. (typical). Sundarbans, Arracan, Rangoon, Moulmein, Penang, Wellesley Province, &c.

Rana gracilis, var. *andamanensis*. Andamans.

—— —, var. *nicobariensis*. Nicobars.

—— —, var. *pulla*. Penang hill.

2. *Rana cyanophlictis*, Schneid. Orissa.

3. *Pyxicephalus breviceps*, Schneid. From near Kotegurh.

4. *Polypedates Hascheanus*, n. sp. A small species from the forests of Penang hill. Distance between anus and heel slightly less than the length of the body; brown, lighter or darker; a blackish band between the eyes, a W-mark between the shoulders, a pair of blackish spots about the middle of the body; limbs with dark cross bands: body of largest specimen $\frac{1\frac{5}{8}}$ inch long.

5. *Polyp. maculatus*, Gray. Penang.

6. *Hylorana Tytleri*, Theob. (?? = *erythræa*, Schleg.). Moulmein.

7. *Hylorana nicobariensis*, n. sp. From the Nicobars. Allied to *H. temporalis* of Günther, but has two small glandular tubercles behind the angle of the mouth; distance between anus and heel less than the length of the body, fourth toe less than its half.

Ansonia, n. gen. (*Rhinodermatidæ*). Body slender, limbs long and slender, fingers free, toes half-webbed, disks scarcely swollen; muzzle short, canthus rostralis sharp; no teeth; tongue entire, oval, elongated.

8. *A. penangensis*. Found on rocks in streams on Penang hill. Full-grown specimen $\frac{1\frac{4}{8}}$ inch, hind limb $1\frac{5}{8}$ inch; body tubercular, black with pale yellowish-white spots on the side, and purplish-red below, between the limbs and on the lower belly.

9. *Diplopelma carnaticum*, Jerdon.

10. *Caloula pulchra*, Gray. From Moulmein.

11. *Bufo viridis*, Laur. From the Sutej valley.

12. *Bufo melanostictus*, Schneid. From Bengal, Burma, Malay peninsula, Andamans, and Nicobars.

REPTILIA.

LACERTILIA.

13. *Ptychozoon homalocephalum*, Kuhl. Nicobars.

14. *Gecko guttatus*, Daud. Burma and Andamans.

15. — *stentor*, Cant. Andamans.

16. — *Smithii*, Gray. Java.

17. *Phelsuma andamanense*, Blyth. Andamans.

18. *Peripia Peronii*, Cant. Penang.

19. — *Cantoris*, Günth. Andamans.

20. *Hemidactylus frenatus*, Schleg. Burma, Penang, Andamans, and Nicobars.

21. *Hemidactylus maculatus*, D. & B. Moulmein, Andamans, Calcutta, &c.

22. *Cyrtodactylus rubidus* (*Puellula rubida*, Blyth). Andamans.
 23. — *affinis*, n. sp. Penang. Like *Gymnodactylus pulchellus*, Gray, in form and coloration, but with longer fingers and toes, and apparently more depressed body, no enlarged chin-shields or subcaudals, and no femoral pores.
 24. *Tiliqua carinata*, Schneid. (*Eup. rufescens* apud Günth.). Bengal, Burma, Penang, Andamans, &c.
 25. *Tiliqua olivacea*, Gray, Nicobars.
 26. — *rugifera*, n. sp. Nicobars. Each scale five-keeled; scales in 26 series round the body, 23 transverse rows between the limbs, 8 longitudinal rows on the belly; brown above, two pale streaks on the anterior half of the body, pale yellowish or greenish-white below.
 27. *Mabouya Jerdoniana*, n. sp. Penang. Like *M. agilis*, Gray, but it has 7 supraciliaries, 8 upper labials, scales in 39 series round the body, 60 transverse rows between the limbs; preanals scarcely, subcaudals distinctly enlarged.
 28. *Hinulia maculata*, Blyth. Martaban.
 29. *Riopa lineolata*, n. sp. Martaban. Similar to *R. Bowringii*, Günth., and equal to it in size, but with scales in 24 longitudinal series round the body, and 60–65 transverse series between the limbs.
 30. *Calotes mystaceus*, D. & B. Arracan, Bassein, Moulmein, &c.
 31. *Bronchocele cristatella*, Kuhl. Penang.
 32. — *moluccana*, Less. Singapore.
 33. — *jubata*, D. & B. Java, Nicobars.
 34. *Tiaris subcristata*, Blyth (*Coryphylax Maximiliani*, Fitz.). Andamans and Nicobars.
 35. *Draco volans*, L. Penang.

OPHIDIA.

36. *Cylindrophis rufus*, Laur. Upper Burma.
 37. *Ablabes melanocephalus*, Gray. Singapore.
 38. — *Rappii*, Günth. Simla.
 39. — *collaris*, Gray. Simla.
 40. — *nicobariensis*, n. sp. Nicobars. Scales smooth, in 17 series, ventrals 189, anal bifid, subcaudals 87; in coloration similar to *melanocephalus*, but the lateral spots are smaller and much more numerous: length $17\frac{1}{2}$ inches, of which that of the tail is $4\frac{1}{4}$ inches.
 41. *Ptyas mucosus*, L. N.W. Himalaya, Moulmein, Andamans.
 42. — *hexagonotus*, Cant. (*Xenelaphis idem* apud Günth.). Penang.
 43. *Compsosoma radiatum*, Rein. Moulmein.
 44. — *melanurum*, Schleg. Andamans.
 45. — *semifasciata* (*Platyceph* idem), Blyth. South of Simla.
 46. — *Hodgsonii*, Günth. N.E. of Simla.
 47. *Tropidonotus quincunciatus*, Schleg. (*Trop. Tytleri* and *striolatus*, Blyth). Burma, Andamans.
 48. *Trop. stolatus*, L. Moulmein, Amherst.
 49. — *platyceph*, Blyth (*Zamenis himalayanus*, Steindachner). Kulu.

50. *Gonyosoma oxycephalum*, Boie. Andamans.
51. *Dendrophis picta*, Gmel. Burma, Andamans, Nicobars, Penang.
52. — *caudolineata*, Gray. Penang.
53. *Chrysopelea ornata*, Shaw. Penang, Burma.
54. — *rubescens*, Gray. Penang.
55. *Psammophis condanurus*, Merr. (*Phayrea isabellina*, Theob.). Simla.
56. *Tragops fronticinctus*, Günth. Amherst.
57. *Dipsas hexagonotus*, Blyth. Andamans.
58. — *multifasciata*, Blyth. South of Simla.
59. *Lycodon striatus*, Shaw. From near Kotegurh.
60. — *aulicus*, L. (*Tytleria hypsirhinoides*, Theobald). Andamans and India generally.
61. *Tetragonosoma effrene*, Cant., var. Banca.
62. *Python molurus*, Linn. Upper Burma, Malayan peninsula.
63. — *reticulatus*, Schneid. Nicobars.
64. *Hypsirrhina plumbea*, Boie. Upper Burma.
65. *Cerberus rhynchops*, Schneid. Burma, Andamans, Nicobars, &c.
66. *Hipistes hydrinus*, Cant. Amherst.
67. *Cantoria Dayana*, n. sp. Amherst. Form typical, scales in 19 series, ventrals 268, anal bifid, subcaudals 56; dull bluish black, with numerous yellowish cross bands, narrow on the back but widening laterally.
68. *Bangurus cæruleus*, Schneid. Bassein.
69. *Ophiophagus elaps*, Schleg. Burma, Andamans.
70. *Naja tripudians*, Merr. N.W. Himalaya, Andamans.
71. *Callophis intestinalis*, Laur. Upper Burma.
72. *Enhydrina valakadyn*, Boie (*E. bengalensis*, Gray). Orissa.
73. — *schistosa*, Daud. Gopalpore.
74. *Pelamis platurus*, L. (*P. bicolor*, Schneid.). Bay of Bengal.
75. *Trimeresurus gramineus*, Shaw. Khasi hills.
76. — *erythrurus*, Cant. Burma, Java.
77. — *carinatus*, Gray. N.W. Himalaya.
78. — *porphyraceus*, Blyth. Andamans.
79. — *mutabilis*, n. sp. Andamans and Nicobars. Scales in 21 series, ventrals 156–167, subcaudals 48–62; second labial forms the angle of the facial pit, or is divided into two shields; colour uniform reddish-brown, or with numerous greenish-white cross bands on the back, laterally with longitudinal bands.
80. *Trimeresurus Cantori*, Blyth. Andamans and Nicobars.
81. — *convictus*, n. sp. Penang. Like *T. monticola*, Günth., but with much larger scales, which are disposed in 21 series; ventrals 132, subcaudals 29.
82. *Halys himalayanus*, Günth. N.W. Himalaya.
83. *Daboia Russelli*, Shaw. N.W. Himalaya.

CHELONIA.

84. *Emys crassicollis*, Bell. Penang.

Dr. Stoliczka gave a short sketch of the relations existing between the Andaman and Nicobar reptilian fauna and that of Burma on one hand, and of Java, Sumatra, and the Philippine Islands on the other hand. All these islands, &c., he said, have many species in common. He also specially noticed the very great number of viperine snakes (*Trimeresurus*) which are to be met with at the Nicobars; but fortunately these species appear to be less dangerous than continental forms usually are. The Nicobarese say that not a single fatal case results from the bite of these *Trimeresuri*; and certainly all the specimens examined had a comparatively small poison-gland. The result of the bite is said to be only a swelling of the wounded part. Dr. Stoliczka also exhibited a specimen of the rare *Callophis intestinalis* obtained from Upper Burma. The species has the poison-glands extending from the head to about $\frac{1}{3}$ of the total length of the body, lying free in the cavity of the anterior part, and causing the heart to be much further removed backward than is generally the case in other species of snakes.—*From the Proceedings of the Asiatic Society of Bengal for April 1870.*

On the Organization and Embryogeny of the Ascidia.—Development of Molgula tubulosa. By M. LACAZE-DUTHIERS.

There are few zoological discoveries which have more vividly and justly excited the interest of naturalists than that of the metamorphoses of the Ascidians. Savigny, in studying the organization of these animals, found some little bodies “among the ova disseminated between the tunic and the branchial sac, which appeared to be foetuses.” If the drawings which he gave prove that he knew the larval form of these animals, it is nevertheless certain that the true significance of these little bodies was not really incontestably proved until after M. Milne-Edwards’s researches.

The subsequent observations of MM. Kölliker, Van Beneden, Kowalewski, Küpffer, and of many other naturalists have only confirmed the remarkable observations of the French zoologist; and now-a-days everybody admits that all the *Ascidians*, when young, at their escape from the egg, have a larval form which makes them comparable, in appearance alone, with the tadpoles of the frogs. This hitherto has been an opinion not only undisputed, but apparently indisputable.

The anatomy of *Molgula*, one of the most interesting types of the group of simple Ascidians, has occupied me during nearly two summers. In studying its development, I wished to compare the morphological data furnished by the observation of the adult with those revealed by the successive appearance of the organs.

To make more certain of my results by multiplying comparisons, I commenced by observing the embryos of some *Phallusia* of the coasts of the Channel, the study of which appeared to me to be comparatively easier; and it is by means of artificial fecundations that I have been able to follow the various transformations of the ovum, commencing with its segmentation, which is appreciable only